REMARKS

In the Office Action, claims 1-6 and 21-22 are rejected under 35 U.S.C. § 101; claim 6 is rejected under 35 U.S.C. § 112, first paragraph; and claims 1-6 and 21-22 are rejected under 35 U.S.C. § 102. Claims 1, 3-6 and 21 have been amended; claim 2 has been cancelled and claims 7-20 have been withdrawn. Applicants respectfully submit that the rejections have been overcome or are improper in view of the amendments and for the reasons set forth below.

At the outset, the Patent Office alleges that the application should be reviewed for errors and conformity with domestic practice. In particular, in keeping with scientific custom, the names of Genera and Species of Micro-organisms should be underlined or italicized throughout the specification and claims as the Patent Office suggests. In response, Applicants have amended the specification to address this issue. Applicants further note that the term *Lactobacillus* has been changed to an italicized form in the claims in further response to the Examiner's alleged issue with respect to the use of such terms. Applicants note for the record that such amendments are deemed for clarification purposes and thus should not be deemed as an intention on the part of Applicants to cancel and/or disclaim any subject matter in view of same. Therefore, Applicants believe that the alleged issues raised by the Examiner regarding the specification as discussed above should be resolved.

In the Office Action, claims 1-6 and 21-22 are rejected under 35 U.S.C. § 101. The Patent Office alleges that the claims read on an organism per se and thus do not embody patentable subject matter as defined under 35 U.S.C. § 101. However, the Patent Office further suggests that Applicants use the claim language "a biologically pure culture" in connection with the strain to identify a product that is not found in nature. In response, Applicants have amended independent claims 1 and 21 to include the term "a biologically pure culture." Thus, Applicants believe that this rejection should be withdrawn.

In the Office Action, claim 6 is rejected under 35 U.S.C. § 112, first paragraph. The Patent Office alleges that it is not clear if the written description is sufficiently repeatable to void the need for a deposit. Further, it is unclear if the starting materials were readily available to the public at the time of the invention.

In response, Applicants respectfully submit that a deposit indeed was made in the present application as filed, a copy of which is attached herewith for the Patent Office's review and

consideration. Applicants further note that the deposited material has been accepted for deposit under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the purpose of Patent Procedure (e.g., see 961 OG 21, 1977) and that all restrictions on the availability to the public of the material so deposited will be irrevocably removed upon the granting of a patent issued with respect to the present application. Further, Applicants believe that the deposit was properly referred to in the body of the specification as originally filed. Therefore, Applicants believe that claim 6 is in compliance with 35 U.S.C. § 112, first paragraph.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

In the Office Action, claims 1-6 and 21-22 are rejected under 35 U.S.C. § 102. More specifically, claims 1-5 and 21-22 are rejected in view of International Patent Publication No. WO 98/06411 ("Guandalini"); claims 1-5 are rejected in view of International Patent Publication No. WO 95/33046 ("Morelli") in light of ATCC Catalogue; claims 1-5 are rejected in view of European Patent Document No. 861905 ("Pedraglio"); claims 1-5 are rejected in view of Tuomola et al.; claims 1-3 and 21-22 are rejected in view of U.S. Patent No. 5,603,930 ("Brassart"); claims 1-3 and 21-22 are rejected in view of U.S. Patent No. 5,837,238 ("Casas"); and claim 6 is rejected under 35 U.S.C. § 102 or, in the alternative, under 35 U.S.C. § 103 in view of Guandalini or Pedraglio or Tuomola or Brassart. Applicants believe that the anticipation and obviousness rejections have been overcome.

Of the pending claims at issue, claims 1 and 21 are the sole independent claims. Claim 1 recites a biologically pure culture of a lactic acid bacterium strain belonging to the genus *Lactobacillus* having a protection property against adhesion of pathogenic bacteria causing diarrhoea to intestinal cells and/or having a protection property against invasion of pathogenic bacteria causing diarrhoea into intestinal cells, which *Lactobacillus* strain is capable of adhering to the intestinal mucosa of a host organism. As amended, claim 1 essentially includes the features of originally filed claim 1 in addition to claim 2 as originally filed and further as supported in the specification, for example, on page 7 at paragraph 5 and page 15 at paragraph 4. Independent claim 21 recites a food containing a biologically pure culture of a lactic acid bacterium strain belonging to the genus *Lactobacillus* having the capability of preventing colonization of the intestine with pathogenic bacteria causing diarrhoea.

The present invention relates to *Lactobacillus* strains that have a protection property against adhesion of pathogenic bacteria causing diarrhoea to intestinal cells and/or having a protection property against the invasion of pathogenic bacteria causing diarrhoea into intestinal cells. Further, the *Lactobacillus* strains of the present invention are also capable of adhering to intestinal mucosa of a host organism. The present strains are so-called probiotic strains, i.e., they essentially survive the conditions prevailing in the various parts of the gut and arrive at the intestine in an essentially live form so that they may successfully adhere to the mucosa. In addition, the claimed strains provide the before-mentioned protection properties by secreting metabolic compounds that have an anti-diarrhoea activity. See, specification, page 7, paragraph 5.

In contrast, the cited art, even if combinable, fails to disclose or suggest the claimed invention. For example, with respect to Guandalini, this document relates to a treatment of acute infant's diarrhoea and to a prevention of allergic reactions in the subsequent phase. To this end, Guandalini proposed the administration of a specific *Lactobacillus* strain "GG", which strain can assist in re-hydration and/or re-nourishing of the affected individual. See, Guandalini, p. 7, l. 1-9. Guandalini does, however, not disclose that *Lactobacillus* GG has a protection property against adhesion of pathogenic bacteria to intestinal cells and/or have a protection property against invasion of pathogenic bacteria into intestinal cells. Guandalini merely lists, for example, on p. 5, l. 16-20, several viruses and bacteria which were found in the feces at the beginning of the study. No data as to the number of the bacteria and/or viruses at the end of the study are given. Additionally, it becomes clear from the entire context of this publication that *Lactobacillus* GG acts as a re-hydration and/or re-nourishing agent (which is certainly of interest for an individual suffering from diarrhoea), thus assisting the body to shorten the duration of diarrhoea. Clearly, this is suggested by the data given in Guandalini, which are directed to a weight increase of the patients. Based on at least these reasons, Guandalini is deficient with respect to the claimed invention.

With respect to Morelli, this reference relates to *Lactobacilli* strains and their use for treating a variety of gastrointestinal disorders, such as intestinal dismicrobism, ulcerative colitis, and diarrhoea of various origins. See, Morelli, p. 5, l. 12-17. In order to demonstrate the activity of the strains of Morelli against harmful micro-organisms in vitro "co-culture experiments" on

culture media were described, wherein a *lactobacillus* is co-cultured with *E. coli* or other bacteria eventually leading to the finding that growth of some bacteria may be inhibited. Indeed, it is impossible to conclude from these experiments how the *lactobacilli* strains would perform in vivo. Further, Morelli does not disclose that any of the strains have a protection property against an invasion of intestinal cells by bacteria and/or a protection property against an adhesion of bacteria to intestinal cells. Therefore, Morelli is clearly deficient with respect to the claimed invention. Moreover, the Patent Office has improperly relied on the ATCC Catalgue reference in combination with Morelli to support the anticipation rejection.

Pedraglio relates to *Lactobacilli* strains useful in the treatment of various disorders of the gastro-intestinal tract, such as peristaltic disorders, gastroenteritis, heartburn, flatulence and diarrhoea, in particular, diarrhoea following the use of antibiotics (Pedraglio, p. 6, 1. 7-8) or after an anti-tumor radiotherapy (Pedraglio, p. 5, 1. 10). However, no information may be derived from Pedraglio whether the *Lactobacilli* of Pedraglio are only helping to reconstitute the microflora of the intestine or whether they are also providing an activity against some particular agents. In this respect, Pedraglio merely teaches that the strains are opposing "pathogens" presumably through a lowering of the pH of the intestinal environment. See, Pedraglio, p. 4, 1. 33 to 35. As the term "pathogen" is not specifically defined, this term may therefore relate to parasites, fungi, bacteria, viruses or even to inorganic particles. Consequently, neither pathogenic bacteria as such, nor pathogenic bacteria causing diarrhoea are mentioned in Pedraglio and thus no information relating to a protection property against an invasion of intestinal cells by said bacteria and/or an adhesion of said bacteria to intestinal cells may be derived from Pedraglio. Thus, Pedraglio fails to disclose a micro-organism that has either of the before-mentioned protection properties as claimed. Therefore, Pedraglio is clearly deficient with respect to the claimed invention.

With respect to Tuomola, this paper merely describes in vitro experiments that relate to the adhesion of various *Lactobacilli* strains to Caco-2 cells in culture. Indeed, the feature of any of the *lactobacilli* strains providing a protection against an invasion of intestinal cells by bacteria and/or providing a protection against an adhesion of pathogenic bacteria causing diarrhoea to intestinal cells cannot be found in Tuomola. Therefore, Tuomola is clearly deficient with respect to the claimed invention.

With respect to Brassart, this reference is deficient with respect to the claimed invention. For example, the primary focus of Brassart relates to a biologically pure culture of *Lactobacillus johnsonii* strain CNCM I-1225. This is different than the claimed invention that recites a biologically pure culture of lactic acid bacterium belonging to the genus *Lactobacillus*, let alone the specific strains (e.g., *Lactobacillus rhamnosus*, *Lactobacillus paracasei* or *Lactobacillus paracasei* CNCM I-2116) as required by claims 4-6. Again, the claimed *Lactobacillus* strain has a protection property against adhesion of pathogenic bacteria causing diarrhea to intestinal cells and/or a protection property against invasion of pathogenic bacteria causing diarrhea into intestinal cells wherein the *Lactobacillus* strain is capable of adhering to the intestinal mucosa of a host organism. For at least these reasons, Brassart is deficient with respect to the claimed invention.

With respect to Casas, this patent merely discloses a method for treating acute diarrhoea (See, Casas, col. 2, lines 1-3) largely caused by rotaviruses, by administering *L. reuteri*. Indeed, Casas makes no mention of pathogenic bacteria that may be found at all. Moreover, since bacteria are clearly not the emphasis of Casas, neither an adhesion to intestinal cells by pathogenic bacteria, nor an invasion of pathogenic bacteria into intestinal cells is disclosed in Casas. Therefore, Casas is deficient with respect to the claimed invention.

Nor does the cited art, even if combinable, suggest the claimed invention. For example, Pedraglio merely provides a process which allows to select *Lactobacilli* strains exceedingly viable and resistant to technological treatments (such as, freeze-drying or mixing with excipients), which strains are useful for the therapeutical and prophylactic treatment of disorders of the gastrointestinal system in humans. See, Pedraglio, p. 2, 1. 46 to 48, 1. 38. Pedraglio does not suggest or disclose that micro-organisms have a protection property against pathogenic bacteria causing diarrhoea that are present in nature at all and may be isolated. In fact, neither pathogenic bacteria as such, nor pathogenic bacteria causing diarrhoea are mentioned in Pedraglio.

In addition, Pedraglio does not also suggest or disclose that micro-organisms having the before-mentioned protective properties as claimed may arrive in the intestine in an essentially live form, adhere to the intestine's mucosa and, once implanted in the mucosa (or even before), exert their beneficial effects presumably by secreting metabolic compounds acting against

pathogenic bacteria. Therefore, Applicants believe that one skilled in the art would consider that Pedraglio on its own is distinguishable from the claimed invention.

Further, Applicants believe that the remaining cited references, alone or even if combinable with Pedraglio, are clearly distinguishable from the claimed invention. For example, Tuomola provides that *lactobacilli* are not a suitable agent for preventing an invasion of intestinal cells by pathogenic bacteria and/or an adhesion of pathogenic bacteria to intestinal cells contrary to the claimed invention. Indeed, Tuomola teaches that all tested *lactobacilli* exhibit an adherence which is inferior to the adherence of an enterotoxicgenic strain of *E. coli*. See, Tuomola, p. 48, Table 1. Thus, Tuomola suggests that *lactobacilli* will not be able to prevent an adhesion of pathogens to the intestine, as the *lactobacilli* will not be forming a layer and thereby will not reside long enough in the gut to provide any activity against pathogenic bacteria.

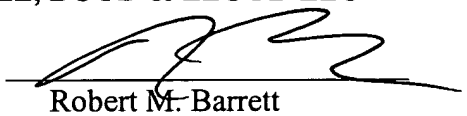
With respect to the remaining cited references, alone or even if combinable, these references are deficient with respect to the specific features of the claimed invention for substantially the same reasons as previously discussed. Indeed, nowhere does the cited art disclose or suggest the claimed *Lactobacilli* having a protection property against an adhesion of pathogenic bacteria causing diarrhoea to intestinal cells and/or having a protection property against an invasion of pathogenic bacteria causing diarrhoea into intestinal cells.

Based on at least these differences between the cited art and the claimed invention as discussed above, clearly, the cited art is distinguishable from the claimed invention. Therefore, Applicants believe that the cited art, even if combinable, fails to disclose or suggest the claimed invention.

Accordingly, Applicants respectfully request that the anticipation and obviousness rejections be withdrawn. For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY 

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Dated: February 17, 2004

TRAITE DE BUDAPEST SUR LA RECONNAISSANCE
INTERNATIONALE DU DEPOT DES MICRO-ORGANISMES
AUX FINS DE LA PROCEDURE EN MATIERE DE BREVETS

FORMULE INTERNATIONALE

DESTINATAIRE :

RECEPISSE EN CAS DE DEPOT INITIAL,
délivré en vertu de la règle 7.1 par
l'AUTORITE DE DEPOT INTERNATIONALE
identifiée au bas de cette page

SOCIETE DES PRODUITS NESTLE S.A.
Patents department
Avenue Nestlé 55
CH-1800 Vevey

NOM ET ADRESSE
DU DEPOSANT

I. IDENTIFICATION DU MICRO-ORGANISME

Référence d'identification donnée par le DEPOSANT :	Numéro d'ordre attribué par l'AUTORITE DE DEPOT INTERNATIONALE :
NCC 2461	I - 2116

II. DESCRIPTION SCIENTIFIQUE ET/OU DESIGNATION TAXONOMIQUE PROPOSEE

Le micro-organisme identifié sous chiffre I était accompagné :

■ d'une description scientifique

■ d'une désignation taxonomique proposée

(Cocher ce qui convient)

III. RECEPTION ET ACCEPTATION

La présente autorité de dépôt internationale accepte le micro-organisme identifié sous chiffre I, qu'elle a reçu le 12 JANVIER 1999 (date du dépôt initial) [1]

IV. RECEPTION D'UNE REQUETE EN CONVERSION

La présente autorité de dépôt internationale a reçu le micro-organisme identifié sous chiffre I le (date du dépôt initial)
et a reçu une requête en conversion du dépôt initial en dépôt conforme au Traité de Budapest le (date de réception de la requête en conversion)

V. AUTORITE DE DEPOT INTERNATIONALE

Nom :	Signature(s) de la (des) personne(s) compétente(s) pour représenter l'autorité de dépôt internationale ou de l'(des) employé(s) autorisé(s) :
CNCM Collection Nationale de Cultures de Microorganismes	Mme Y. CERISIER Directeur Administratif de la CNCM
Adresse : INSTITUT PASTEUR 28, Rue du Docteur Roux F-75724 PARIS CEDEX 15	Date : Paris, le 12 février 1999

1 En cas d'application de la règle 6.4.d), cette date est la date à laquelle le statut d'autorité de dépôt internationale a été acquis.